

DEVELOPMENT OF MICROCONTROLLER-BASED  
SOLDERING SYSTEM

Design Project

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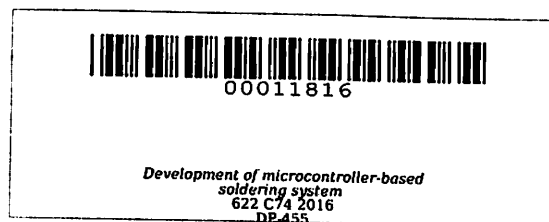
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# **DEVELOPMENT OF MICROCONTROLLER-BASED SOLDERING SYSTEM**

Undergraduate Design Project  
Submitted to the Faculty of the  
College of Engineering and Information Technology  
Cavite State University  
Indang, Cavite

In partial fulfillment  
of the requirements for the degree  
Bachelor of Industrial Technology  
major in Electronics Technology



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## ABSTRACT

**CONCEPCION, ERICSON T., and CATUIRA, MARC JAY M. Development of Microcontroller-Based Soldering System.** Undergraduate Design Project. Bachelor of Industrial Technology major in Electronics Technology. Cavite State University, Indang, Cavite. April 2016. Adviser: Ma. Fatima B. Zuñiga.

The study was conducted from November 2015 to March 2016 at Gen. Trias, Cavite and at Cavite State University, Indang, Cavite to develop a soldering system controlled by microcontroller that could be used in Electronics Laboratories of the Department of Industrial Engineering and Technology. Specifically, the study aimed to:

1. design and develop a battery-operated microcontroller-based soldering system;
2. fabricate a suitcase for the battery-operated microcontroller-based soldering system;
3. test the performance of the project;
4. and evaluate the functionality, durability, economy, workability, aesthetics, and safety of the project.

The idea of developing a microcontroller-based soldering system for electronics laboratory has been proposed by the researcher for the purpose of more convenience, mobility and energy efficiency.

The system was designed to provide a digital soldering station for the students in the electronics laboratory. This is to be utilized in the Electronics Laboratory to improve the soldering techniques of electronics technology major students.

The general methods and procedures followed in developing this system were the following: conceptualized a framework of the design project, procured and mobilized the materials needed in soldering system, design internal circuitry, power supply units of soldering system, design casing of soldering system, construction of casing, installing all circuits and monitoring display in casing, modifying panel switches, pre-testing of the

components, evaluation of soldering system, prepared prototype manual, and conducted cost computation.

The system was evaluated by instructors of Department of Industrial Engineering and Technology, and students from Bachelor of Industrial Technology major in Electronics using the following criteria: functionality, durability, economy, workability, aesthetics and safety. As a result the study was rated outstanding with a numerical scale of 4.60.

Use of large scale battery and improvement of craftsmanship is recommended in future design.

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# **DEVELOPMENT OF A MICROCONTROLLER-BASED SOLDERING SYSTEM**

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A design project presented to the faculty of Department of Industrial Engineering and Technology, College of Engineering and Information Technology, Cavite State University, Indang, Cavite in partial fulfillment of the requirements for the Degree Bachelor of Industrial Technology major in Electronics Technology with Contribution No. CEIT-2015-2-152. Prepared under the supervision of Ms. Ma. Fatima B. Zuñiga.

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## **INTRODUCTION**

Soldering iron and hot air solder are the primary tools used in the assembly and disassembly of electronic components in electronic company production, service center shops, seminars in soldering techniques and even in school laboratories. Soldering is similar to welding but it is quite different. In welding, it is a making of super-strong joint between two pieces of metal. The objective of welding is to make a good mechanical connection. In soldering, only the solder itself is melted. The idea is usually to make a good electrical connection. Soldering iron and hot air solder are commonly used to solder joints of electronic components and to remove joints or to disconnect two or more electronic components.

In the late 1800s, the first soldering iron was heated by open flame or burning coals. It is used until 1920s most heated by open flame. In 1950s, torch heated soldering irons are commonly used by roofers and plumbers. The earliest electric soldering irons are manufactured in the late 1800s. An electric soldering iron is typically on whenever it is plug in.